TITLE OF INVENTION

Sport Dog Locator

CROSS-REFERENCE TO RELATED APPLICATIONS

Not Applicable.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

Not Applicable.

BACKGROUND OF THE INVENTION

1. Field of Invention

[0001] This invention pertains to a device for indicating the relative location and current behavior of a dog in a sporting field. More particularly, this invention pertains to a device for accurately interpreting and indicating the current behavior of a dog regardless of the orientation of the device.

2. Description of the Related Art

[0002] A sporting dog locator is an apparatus typically used by hunters, trainers, and handlers to gain knowledge of the location of a dog that is participating in a sporting event and to gain knowledge of the behavior of the dog in the sporting field. Typical information regarding sporting dog behavior that is of interest to a handler is whether a dog is tracking or on point. Conventional sporting dog locators are carried by a dog and indicate whether the dog is tracking or on point with respective and distinguishable audible signals.

[0003] In order to determine whether a dog is tracking or on point, sporting dog locators determine whether the dog is moving or stationary. Conventional sporting dog locators employ vibration responsive switches to detect the intensity of the movement of a dog, and from the intensity of the movement, it is determined whether a dog is moving or stationary. A vibration switch is typically a cylindrical-shaped apparatus that forms an enclosure and contains a free-moving electrically conductive mass member that is in electrical contact with the sidewall of the enclosure. The

sidewall of the enclosure is electrically grounded and a single electrical contact is disposed within the enclosure at one end of the cylindrical-shaped switch. When the mass member engages the electrical contact, a circuit is completed and a signal is produced. The frequency at which the signals are produced indicates the intensity of the movement of the equipped dog, thus indicating whether the dog is tracking or on point.

[0004] Conventional sporting dog locators are limited in that their vibration switches include only a single electrical contact. A vibration switch of this nature does not operate properly if the orientation of a dog leaves the vibration switch in a position that prevents the mass member from engaging the electrical contact. This incapacitating position occurs when a dog simply raises or lowers his head or travels along a steep incline or decline.

[0005] Conventional sporting dog locators are also limited in that their vibration switches typically use a fluid for debouncing or vibration dampening. This requires a vibration switch to include a fluid-tight seal such that the vibration switch retains the fluid that fills the enclosure. Additionally, the fluid slightly restricts the movement of the mass member such that the production of signals due to small and insignificant movement, such as heavy breathing, is eliminated. The inclusion of the fluid-tight seal increases the expenses to produce a vibration switch and ultimately increases the expenses to produce a locator device.

BRIEF SUMMARY OF THE INVENTION

[0006] In accordance with the various features of the present invention there is provided a locator device for indicating the relative location of a dog in a sporting field and for indicating whether the dog is tracking or on point regardless of the orientation of the device. The locator device reveals the location of a dog by emitting a substantially loud audible signal such that a handler is able to hear the signal and understand the direction in which the dog is working. The locator device calculates whether a dog is tracking or on point by measuring the intensity of the movement of the dog with a vibration switch and then interpreting the intensity of movement. The vibration switch includes two electrical contacts that are disposed substantially on the longitudinal axis of the vibration switch. Because the vibration switch is positioned

within the locator device such that the longitudinal axis of the vibration switch is substantially parallel to the backbone of the dog, the locator device operates as designed regardless of the orientation of the device. The locator device indicates whether a dog is tracking or on point by emitting respective and distinguishable sequences of audible signals.

[0007] The locator device includes a vibration switch, a processing device, a sound generating device, and a housing. The housing is carried by a dog and accommodates the remaining components of the locator device. The vibration switch is used to detect the intensity of the movement of a dog. The processing device interprets the intensity of movement to indicate that the dog is tracking or that the dog is on point. A corresponding signal is then transferred by the processing device to the sound generating device, which emits an audible signal that indicates to a handler whether a dog is tracking or on point.

[0008] The vibration switch includes an enclosure formed by a cylindrical-shaped housing and two electrical contacts found within the enclosure. One electrical contact is disposed at each end of the housing while the sidewall of the enclosure is electrically grounded. The vibration switch includes an electrically conductive mass member that resides within the enclosure of the vibration switch and remains in substantially continuous electrical contact with the sidewall of the enclosure. When the electrically conductive object contacts either of the electrical contacts disposed at the ends of the housing, a circuit is completed and a signal is produced. The circuit interprets the signal produced by the vibration switch to indicate that the dog is tracking or that the dog is on point.

[0009] The vibration switch is disposed within the locator device such that when the device is carried by a dog, the longitudinal axis of the vibration switch is substantially parallel to the backbone of an equipped dog. Because the electrical contacts are positioned at the ends of the cylindrical-shaped housing of the vibration switch, the electrical contacts are positioned along the longitudinal axis of the vibration switch. Understanding the typical movements of a dog, it can be seen that this configuration allows the locator device to operate as designed regardless of the orientation imposed by a dog on the locator device.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0010] The above-mentioned features of the invention will become more clearly understood from the following detailed description of the invention read together with the drawings in which:

Figure 1 is an exploded view of a locator device constructed in accordance the with various features of the present invention;

Figure 2 is an end elevation view of the locator device of Figure 1 illustrating the controls for adjusting the modes of operation;

Figure 3 is a perspective view of a vibration switch constructed in accordance with the various features of the present invention;

Figure 4 is a side elevation view of the vibration switch of Figure 3 in section, taken along lines 4-4;

Figure 5 is a top plan view of the locator device of Figure 1 in section, taken along lines 5-5; and

Figure 6 is an illustration of a sporting dog wearing the locator device of Figure 1 illustrating the directions of typical movement of a dog in the sporting field.

DETAILED DESCRIPTION OF THE INVENTION

[0011] One embodiment of a locator device for indicating the relative location of a dog in a sporting field and for indicating whether the dog is tracking or on point regardless of the orientation of the device and constructed in accordance with the various features of the present invention is illustrated generally at **10** in the Figures. The locator device **10** reveals the location of a dog by emitting a substantially loud audible signal such that a handler is able to hear the signal and understand the direction in which the dog is working. The locator device **10** calculates whether a dog is tracking or on point by measuring the intensity of the movement of the dog and interpreting the intensity of movement regardless of the orientation of the locator device **10**. The locator device **10** indicates whether a dog is tracking or on point by emitting respective and distinguishable sequences of audible signals.

[0012] Figure 1 illustrates a perspective view of the locator device **10** in accordance with the various features of the present invention. The locator device **10** includes a housing **12**, which, in the illustrated embodiment, is a cylindrical-shaped

housing that includes a first port **14**, a second port **16**, a communication device **18**, and collar brackets **20**. The first port **14** provides an opening that accommodates a power source **22** for powering the circuitry of the locator device **10**. The power source **22** of the illustrated embodiment is a conventional 3V battery. The locator device **10** is activated by securing a first lid **24**, which in the illustrated embodiment includes a first female threaded portion, to a compatible first male threaded portion **26** that encircles the first port **14**. The first lid **24** includes an electrically conductive material disposed on the inside surface of the first lid **24** such that when secured to the first port **14**, the electrically conductive material completes a circuit by engaging a contact of the power source **22** and an activation electrical contact **28**, thus activating the locator device **10**. Those skilled in the art will recognize that other activating mechanisms may be used without departing from the scope or spirit of the present invention.

[0013] The second port **16** accommodates the mode of operation controls. A second lid **30** includes a second female threaded portion **32** which is compatible with a second male threaded portion **34** that encircles the second port **16**. When the first lid **24** is secured to the first threaded portion **26** and the second lid **30** is secured to the second threaded portion **34**, the locator device **10** is sealed such that water or other environmental elements detrimental to the operation of the locator device **10** are unable to enter the locator device **10**. Those skilled in the art will recognize that other closures may be used without departing from the scope or spirit of the present invention.

[0014] In the illustrated embodiment, the locator device **10** is carried by a dog by way of the collar brackets **20a**, **20b**. The collar brackets **20a**, **20b** receive the collar of a dog such that after the collar is inserted through the collar brackets **20a**, **20b**, the collar is conventionally secured around the dog's neck. When the locator device **10** is attached to a dog, the locator device **10** is positioned on top of the dog's neck. Those skilled in the art will recognize that other ways of attaching the locator device **10** to a dog may be used without departing from the scope of spirit of the present invention.

[0015] The handler is alerted to the relative location and behavior of a dog in a sporting field by the signal emitted by the communication device **18**. In the illustrated

embodiment, the communication device **18** is a sound generating device that emits audible signals that indicate the relative location of a dog and whether the dog is tracking or on point. In the illustrated embodiment, the communication device **18** is located within a cylindrical extension **35** disposed on the housing **12** opposing the collar brackets **20** with regard to the housing **12** such that when the locator device **10** is attached to a dog, the audible signal is directed away from the dog's head.

[0016] Another embodiment of the locator device **10** includes alerting the handler to the relative location and behavior of a dog in a sporting field by way of a communication device **18** that transmits a signal from the locator device **10** to a corresponding receiver that is accessible by the handler. The receiver displays the relative location of the dog and indicates whether the dog is tracking or on point. Those skilled in the art will recognize that other ways of indicating the location and behavior of dog to a handler may be used without interfering with the scope and spirit of the present invention.

[0017] Those skilled in the art will recognize that the previously described locator device **10** is only one embodiment of the present invention. The shapes, positions, and quantities of the aforementioned components may vary without departing from the scope or spirit of the present invention.

[0018] Figure 2 illustrates a side elevation view of the second port **16** of the locator device **10**. The second port **16** accommodates the mode of operation controls, which, in the illustrated embodiment, include a mode switch **36** for setting the desired mode of operation and a volume switch **38** for adjusting the volume of the audible signal emitted by the communication device **18**. In the illustrated embodiment, the mode switch **36** is a rotary switch that allows a handler to select from the offered modes of operation and the volume switch **38** is a toggle switch that allows a handler to select a volume setting of HI or LO. The modes of operation offered by the locator device **10** of the illustrated embodiment include: 1) indicating that a dog is on point with a single beep, 2) indicating that a dog is on point with a single beep and that a dog is tracking with a single beep that is distinguishable from the single beep associated with a dog being on point, 3) indicating that a dog is on point with a double beep, and 4) indicating that a dog is on point with a double beep and that a dog is

tracking with a double beep that is distinguishable from the double beep associated with a dog being on point. The double beeping modes are implemented such that two locator devices **10** can be used simultaneously while maintaining a differentiation between the equipped dogs. The described modes of operation apply to only one embodiment of the present invention, hence, other modes of operation may be used without departing from the scope or spirit of the present invention.

[0019] Those skilled in the art will recognize that other switches may be used for the mode switch **36** and the volume switch **38** without departing from the scope or spirit of the present invention. Additionally, those skilled in the art will recognize that controls other than the described mode of operation controls may be used without departing from the scope or spirit of the present invention.

[0020] Figure 3 illustrates a perspective view of a vibration switch **40** in accordance with features of the present invention. The vibration switch **40** of the illustrated embodiment includes a cylindrically-shaped and electrically grounded sidewall **42**. A first switch cap **44** and a second switch cap **46** are disposed at opposing ends of the sidewall **42** such that an enclosure is formed within the sidewall **42**. Additionally, the first switch cap **44** and the second switch cap **46** are electrical insulators. A first conductive wire **48** is electrically connected to the vibration switch **40** at the first switch cap **44** and a second conductive wire **50** is electrically connected to the vibration switch **40** at the second switch cap **46**. The first conductive wire **48** and the second conductive wire **50** electrically connect the vibration switch **40** to the main circuitry of the locator device **10**.

[0021] Figure 4 is a side elevation view of the vibration switch **40** of Figure 3 in section, taken along lines 4-4. A first electrical contact **52** is disposed within the enclosure at the first switch cap **44** and is in electrical communication with the first conductive wire **48**. Similarly, a second electrical contact **54** is disposed within the enclosure at the second switch cap **46** and is in electrical communication with the second conductive wire **50**. The first electrical contact **52** and the second electrical contact **54** are electrically isolated from the sidewall **42** by the first switch cap **44** and the second switch cap **46**, respectively. The vibration switch **40** includes an electrically conductive mass member **56**, which in the illustrated embodiment is a

sphere that is sized slightly smaller than the cylindrical enclosure such that the mass member **56** moves without restriction within enclosure while remaining in substantially continuous electrical contact with the sidewall **42**. Because the sidewall **42** is electrically grounded and the mass member **56** is electrically conductive and in electrical contact with the sidewall **42**, the engagement of the mass member **56** and either the first electrical contact **52** or the second electrical contact **46** closes the switch, which produces a signal that is transferred to the remaining circuitry of the locator device **10**.

[0022] Figure 5 is an illustration of a dog wearing the locator device **10** illustrating the directions of the forces applied to the locator device **10** due to the motions of a dog in a sporting field. It is understood that the motions of a dog in the sporting field are typically in a longitudinal direction **62** and in a vertical direction **64**, thus, the directions of the forces on the locator device **10** are typically in the longitudinal direction **62** and the vertical direction **64**.

[0023] Figure 6 is a top plan view of the locator device **10** in section, taken along lines 5-5 of Figure 1, illustrating a pictorial block diagram of the circuitry of the present invention. A processing device **58** is in electrical communication with the mode switch **36**, the volume switch **38**, the vibration switch **40**, and an amplifier circuit **60** that conditions signals for the communication device **18**. The processing device **58** reads the condition of the mode switch **36** and the condition of the volume switch **38** to determine the manner in which to represent the behavior of an equipped dog. The processing device **58** then reads the signals produced by the vibration switch **40** to establish the actual behavior of the dog.

[0024] The vibration switch **40** is positioned within the housing **12** such that the longitudinal axis of the vibration switch **40** is substantially parallel to the backbone of an equipped dog. This orientation allows the vibration switch **40** to operate as designed regardless of the orientation of the locator device **10** imposed by the dog. The vibration switch **40** indicates the behavior of the dog by indicating the intensity of the movement of the dog. For example, as a dog is running, or tracking, the locator device **10** moves intensely. Consequently, the vibration switch **40** is proportionally agitated, causing the mass member **56** to contact the first electrical

contact **52** and the second electrical contact **54** at a relatively high frequency. The processing device **58** reads the high frequency of signals and interprets the high frequency to mean the dog is tracking. Similarly, when a dog is on point, the locator device **10** barely moves. Consequently, the vibration switch **40** is barely agitated, allowing the mass member **56** to rest on one of the electrical contacts. The processing device **58** reads the constant signal and interprets the signal to mean the dog is on point.

[0025] As the processing device **58** reads the signals produced by the vibration switch **40**, the processing device **58** performs the task of debouncing. Debouncing is the elimination of the realization of the multiple engagements by the mass member **56** and either the first electrical contact **52** or the second electrical contact **54** during the closing of the vibration switch **40** due to bouncing, thus a single signal is revealed for the closing of the vibration switch **40**. Debouncing for the vibration switch **40** is also translated to be the elimination of the realization of signals produced by the small and insignificant movements of a dog that is on point. The insignificant movements include the panting of the dog, the heartbeat of the dog, or the twitching of the muscles of the dog. Because the processing device **58** performs the task of debouncing, it is not necessary for the vibration switch **40** to be fluidly sealed and filled with a fluid.

[0026] Once the signal from the vibration switch **40** has been read by the processing device **58** and the signal has been debounced, the processing device **58** sends a signal that corresponds to the condition of the mode switch **36**, that corresponds to the condition of the volume switch **38**, and that corresponds to the frequency of the signal of the vibration switch **40** to an amplifier circuit **60**. The amplifier circuit **60** conditions the signal to be received by the communication device **18**, which emits the signal in the form of an audible signal that indicates to a handler whether the equipped dog is tracking or on point.

[0027] Considering the multiple electrical contact design of the vibration switch **40** and the orientation of the vibration switch **40** within the locator device **10** and the orientation of the locator device **10** when attached to a dog and the typical

motions of a dog in the sporting field, it is understood that the locator device **10** operates as designed regardless of the orientation of the device imposed by the dog.

[0028] Those skilled in the art will appreciate the circuit in Figure 6 is not intended to show every component or interconnection. For example power supply lines and regulation, trim, and filtering components are omitted but their use and implementation will be understood by those skilled in the art.

[0029] From the foregoing description, those skilled in the art will recognize that a device for indicating the relative location and behavior of a dog in a sporting field offering advantages over the prior art has been provided. The device provides a vibration switch for detecting the intensity of the movement of a dog which is then translated to the behavior of the dog which is presented to a handler by an audible signal. Further, the device provides a vibration switch including two electrical contacts that allows the device to operate as designed regardless of the orientation of the device.

[0030] While the present invention has been illustrated by description of several embodiments and while the illustrative embodiments have been described in considerable detail, it is not the intention of the applicant to restrict or in any way limit the scope of the appended claims to such detail. Additional advantages and modifications will readily appear to those skilled in the art. The invention in its broader aspects is therefore not limited to the specific details, representative apparatus and methods, and illustrative examples shown and described. Accordingly, departures may be made from such details without departing from the spirit or scope of applicant's general inventive concept.